CLAIMS

What is claimed is:

1. A method of manufacturing a pad for polishing a substrate, the method comprising the steps of:

a) providing a polymer sheet having a substrate contacting area;

b) heating the area a sufficient amount; and

c) applying mechanical pressure greater than 1500 psi (10.3 megapascals) to the area during at least a portion of the heating step.

2. The method of claim 1 further comprising the steps of:

d) cooling the polymer sheet; and

e) providing a sufficient amount of mechanical pressure to the sheet during at least part of the cooling step.

3. The method of claim 1 wherein the polymer sheet comprises a thermoplastic polymer.

4. The method of claim 1 wherein the polymer sheet comprises a non-woven felt impregnated with a thermoplastic polymer.

5. The method of claim 3 wherein the step of heating the polymer sheet a sufficient amount comprises heating to temperatures greater than about 300 degrees F (149 degrees C).

6. The method of claim 4 wherein the step of heating the polymer sheet a sufficient amount comprises heating to temperatures greater than about 300 degrees F (149 degrees C).

7. The method of claim 3 wherein the step of heating the polymer sheet a sufficient amount comprises heating to temperatures in the range of about 300 degrees F (149 degrees C) to about 450 degrees F (232 degrees C).

8. The method of claim 4 wherein the step of heating the polymer sheet a sufficient amount comprises heating to temperatures in the range of about 300 degrees F (149 degrees C) to about 450 degrees F (232 degrees C).

9. The method of claim 4 wherein the thermoplastic polymer comprises polyurethane and the step of heating the polymer sheet a sufficient amount comprises heating to a temperature of about 400 degrees F (204 degrees C).

10. The method of claim 1 wherein step c comprises compressing the polymer sheet to a predetermined thickness.

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11. A method of manufacturing a pad for polishing a substrate, the method comprising the steps of:

providing a polymer sheet comprising a non-woven felt impregnated with a thermoplastic polymer, the sheet having a density less than about 0.7 grams per cubic centimeter, the sheet having a substrate contacting area;

heating the area a sufficient amount and contemporaneously applying a sufficient amount of mechanical pressure to the area so that the density of the sheet increases to greater than about 0.7 grams per cubic centimeter.

12. The method of claim 11 wherein the mechanical pressure compresses the polymer sheet to a predetermined thickness.

13. The method of claim 11 wherein the mechanical pressure compresses the polymer sheet to a density greater than about 0.9 grams per cubic centimeter.

14. The method of claim 11 wherein the mechanical pressure compresses the polymer sheet to a density of about 1 gram per cubic centimeter.

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15. A polymer composite comprising a non-woven felt of polymer fibers impregnated with a resin, the composite having a density greater than about 0.70 grams per cubic centimeter, the composite having a Shore D hardness of at least 50.

16. The composite of claim 15 wherein the resin comprises a polyurethane and the felt comprises polyester.

17. The composite of claim 15 wherein the density is about 1 gram per cubic centimeter.

18. The composite of claim 16 wherein the Shore D hardness is greater than about 60.

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19. A method of making a composite polymeric material, the method comprising the steps of:

providing a non-woven felt impregnated with a polymer resin;

applying heat to the felt and the resin at a temperature in the range of about 358 degrees Fahrenheit (181 degrees C) to about 450 degrees Fahrenheit (232 degrees C) and contemporaneously applying a mechanical pressure greater than about 2500 psi (17.2 megapascals);

cooling the felt and the resin; and

providing a sufficient amount of mechanical pressure to the felt and the resin during at least part of the cooling step so as to maintain a planar surface for the felt and the resin.

20. The method of claim 19 wherein the pressure is about 2900 psi (20 megapascals).